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TITLE OF THE INVENTION

CASE WITH A SEALING ELEMENT

CROSS-REFERENCE TO RELATED APPLICATIONS:

[0001] This application claims priority to French Application Nos. 02 13854, filed November 6, 2002 and 02 14309, filed November 15, 2002 and to U.S. Provisional Application No. 60/444,678 filed February 4, 2003, the entire content of all three applications is hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to cases designed to contain products, such as for example cosmetic or beauty care products.

BACKGROUND OF THE INVENTION

DISCUSSION OF BACKGROUND

[0003] French patent application 2 803 993 proposes to fit a sealing element on a lid in a pivoting manner around a geometrical axis of rotation parallel to that of a hinge connecting the lid to the base part.

[0004] Document US 5,988,185 describes a known packaging device incorporating a base part designed to hold a reserve of product and a lid fitted with a protective element. The protective element incorporates an elastically deformable element and is capable of covering in a detachable manner a free surface for taking the product from the product reserve. The protective element then bears elastically against the free surface of the product reserve.

SUMMARY OF THE INVENTION

[0005] There is a need to further improve the covering and/or sealing of the closure element of the conventional cases.

[0006] Thus, the object of the invention according to one preferred embodiment is a case including a base part holding a product reserve, a lid covering the base part, and a sealing element arranged to close in a leak tight manner a space containing the product, at least when the lid is closed. The sealing element can be supported by a pivot incorporating a ball joint enabling it to rotate about at least two mutually perpendicular geometrical axes of rotation.

[0007] The invention can provide a leak tight contact between the sealing element and a corresponding surface of the base part or of a cup seated in the base part. The invention can also accommodate differences of position of the cup in the base part or excess thicknesses caused by glue spots serving to attach the cup to the base part.

[0008] Advantageously, the pivot can include or be supported by a resiliently deformable part, which can further improve the sealing tightness. The sealing element can be attached to the device with the capability to move along a third axis perpendicular to the two mutually perpendicular axes.

[0009] The product reserve can be contained in a compartment defined in the base part, or in a cup, for example made of metal, supported by the base part. This cup can be glued to the base part. The compartment or cup can have a free edge, for example a rolled edge, against which the sealing element can bear.

[0010] The term "ball joint" is understood to mean any pivoting element allowing rotation around a point. This arrangement can increase mobility of the whole surface of the sealing element relative to the lid. The ball joint can, for example, involve the engagement of a head in a receptacle. Alternatively, the ball joint can also be obtained in a different manner, and can notably include an elastically deformable material, for example an elastomer. The portion of the pivot that is actually elastically deformable is then preferably placed at a distance from the edges of the cup such that a point of rotation can be defined at a distance from these edges. The ball joint formed at this point of rotation can then include a part forming an axis to connect the lid to the seal, this axis including a preferential point of flexure forming the point of rotation.

[0011] The sealing element can include a plate. This plate can be arranged to bear on the base part or the cup at least when the case is closed. This plate can be at least partially covered by an elastomer coating or include other sealing mechanisms, for example in the form of a flexible lip.

[0012] The product can contain at least one hydrocarbon-based solvent that is volatile at ambient temperature, for example hydrocarbon, for example isododecane.

[0013] The lid can be pivotably coupled to the base part. The sealing element can be attached to the lid. In an other embodiment, the sealing element can be attached to an element other than the lid, for example pivotably coupled to the base part.

[0014] This pivoting element can define, for example, a compartment to receive an applicator, notably a sponge.

[0015] According to an embodiment of the invention, it can be advantageous to make the case in such a manner as to create an initial lift effect to reduce the force needed to detach the sealing element from the surface against which it bears in a leak tight manner. This feature can be useful to reduce "suction-cup" effects due to a relatively low pressure in the space containing the product.

[0016] The sealing element can, for example, be made with an asymmetrical arrangement tending to avoid the "suction cup" effect on opening. For example, the sealing element can unevenly deform at its periphery, creating one or more areas of initial lift.

[0017] The sealing element can also be made so as to deform by bending about an axis on opening. The sealing element can, for example, be made with a plate having an asymmetrical feature, such as a variation in thickness.

[0018] The pivot can also be made so as to favor a pivoting or bending movement of the sealing element to facilitate opening. For example, the pivot can be asymmetrical relative to a third axis perpendicular to the geometrical axes of rotation.

[0019] A pivot support can also be made so as to favor such a movement.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Other characteristics and advantages of the invention will become apparent from the following detailed description, particularly when considered in conjunction with the drawings in which:

[0021] Figure 1 shows a schematic partial cross-section of an example of a case made according to the invention,

[0022] Figure 2 shows a top view, in isolation, of the sealing element of the case in Figure 1,

[0023] Figure 3 shows a schematic and partial view of an alternative embodiment wherein the rim of the compartment containing the product includes a seal against which the sealing element can bear,

[0024] Figure 4 is a schematic view, in perspective, of an alternative embodiment wherein the sealing element is mobile relative to the lid,

[0025] Figures 5 and 6 are schematic illustrations of embodiments wherein the product is contained in a cup fitted into a compartment in the base part of the case,

[0026] Figures 7 and 8 illustrate alternative embodiments of the pivot, and

[0027] Figures 9 to 12 illustrate alternative embodiments designed to facilitate opening in case of a relatively low pressure in the space containing the product.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] Figure 1 illustrates a case 1 including a base part 2 and a lid 3 pivoted relative to the base part by a hinge 8 about a geometrical axis of rotation perpendicular to the plane in Figure 1.

[0029] The base part 2 includes a first compartment 4 which can contain a reserve of a product P, for example a foundation or a powder make-up, and a second compartment 5 designed to house an applicator 16 for application of the product P, for example a sponge.

[0030] In the example in question, the base part 2 comprises two elements, including an outer shell 6 and an inner element 7 fitted into the outer shell 6. The inner element 7 defines the first and second compartments 4 and 5 described above. The inner element 7 can be fixed in the outer shell 6 by any suitable mechanism, for example by gluing, soldering or snap-on fixing.

[0031] The lid 3 includes, at its end opposite the pivot 8, a closure 9 incorporating, for example, a lug capable of latching onto a counterpart projection on the base part 2, a mirror 10 and a supporting element 11 for an element 12. The element 12 is designed to cover the compartment 4 containing the product P when the case 1 is closed. In a preferred embodiment, the element 12 seals the compartment 4 in a leak tight manner in the closed lid position. This feature can be useful, for example, to avoid evaporation of a volatile solvent which may be contained in the product P.

[0032] According to a preferred embodiment of the invention, the element 12 is connected to the support element 11 by a pivot 13. The pivot 13 allows the element 12 to pivot about an axis passing through the pivot 13. In a preferred embodiment, the element 12 rotates about at least two mutually perpendicular geometrical axes of rotation, such as an axis X parallel to the axis of hinge 8 and an axis Y perpendicular to that of hinge 8 and contained in the plane of Figure 1. In another embodiment, the element 12 pivots about at least one axis, e.g. axis Y, which makes an angle with the axis of the hinge 8.

[0033] In the illustrated example, the pivot 13 includes a ball joint 14 in a receptacle or cage 15. The ball joint 14 can rotate about the axes X and Y within the cage 15. The sealing element 12 includes a plate 17. The ball joint 14 can be made, for example, in one piece by plastic injection molding with the plate 17 of the sealing element 12. The cage 15 can be made, for example, in one piece with the support element 11.

[0034] As illustrated in Figure 2, the plate 17 can be made with stiffening-ribs 18 on its opposite surface from the product P. The surface of the plate 17 facing towards the product P can be covered in its entirety or around its periphery only by an elastomer coating 19. The coating 19 can provide a leak tight contact by bearing, in the example shown, against the edge of a rib 22 surrounding the compartment 4.

[0035] As a variant illustrated in Figure 3, the plate 17 need not be covered with elastomer and the base part can include a seal 20, for example a molded elastomer seal or fitted sealing lip against which the plate 17 bears when the case 1 is closed. In another variant (not shown), the sealing element 12 can also be made with a sealing lip arranged to engage in a leak tight manner with a counterpart surface on the base part.

[0036] As shown in Figure 1, the support element 11 can be made to enable the cage 15 to move relative to the lid 3 on a geometrical axis Z perpendicular to the axes X and Y. The support element 11 can, for example, be made with arms 83 having a degree of flexibility, connecting the cage 15 to the upper part 24 of the support element 11 by which the latter is attached to the lid 3.

[0037] When the case 1 is closed, the element 12 can bear against the rim of the compartment 4. In a preferred embodiment, the element 12 closes the compartment 4 in a leak tight manner. The ability of the sealing element 12 to pivot relative to the lid 3 about the axes X and Y can reduce the risk of non-leak tight application of the sealing element 12 against the counterpart surface of the base part 2, and can allow for any differences in positioning of the inner element 7 inside the outer shell 6.

[0038] In the example of Figure 1, the product P is placed directly in the compartment 4 defined by the inner element 7. The scope of the present invention is not exceeded when the product P is contained in a cup 50. The cup 50 can be made of metal, for example, fitted onto the base part 2. The cup 50 can be, for example, glued to the base part 2, as shown in Figures 4 and 5.

[0039] Rather than being pivoted on a support element attached to the lid, the sealing element 12 can pivot directly on the lid 3 or on an intermediate element 60 that is mobile relative to the lid 3.

[0040] In the example of Figure 4, the intermediate element 60 pivots with respect to the base part 2. On the side facing the lid 3, the intermediate element 60 can define a compartment to receive an applicator 16. The applicator 16 can be a sponge, for example.

[0041] In Figure 4, the pivot connecting the sealing element 12 to the intermediate element 60 is not apparent. This pivot can be made, for example, with a ball joint 14 as

illustrated in Figure 5. The sealing element 12 can bear against the upper edge 51 of the cup 50. The upper edge 51 can be rolled so as not to damage the coating 19.

[0042] The pivoting action of the sealing element 12 relative to the intermediate element 60 can accommodate not only discrepancies attributable to the position of the cup 50 in its compartment but also any variations in the level of the upper edge 51 of the cup attributable to the thickness of the glue spots which may be used to attached the latter to the base part 2.

[0043] As a variant, the sealing element 12 can bear against the rim 27 of the compartment receiving the cup 50, as illustrated in Figure 6.

[0044] Whether the sealing element 12 is integral with the lid 3 or with an intermediate element 60 mobile relative to the lid, the pivoting action can be achieved other than by a ball joint incorporating a head 14 engaged in a cage 15.

[0045] By way of example, Figure 7 illustrates a pivot made in an elastomer material 30 molded onto the plate 17 of the sealing element 12. As seen in Figure 7, the material of the pivot 30 can, if desired, extend to the edge of the plate 17 and overlap slightly onto the inner face. This overlap feature can replace the leak tight covering 19 previously described.

[0046] The pivot 30 can be fixed, for example, by glue 55 to the lid 3 or to the intermediate element 60. As a variant, the material of the pivot 30 can be molded both onto the plate 17 and onto the lid 3 or a support element attached to the latter or the intermediate element 60, thus serving to attach the sealing element to the rest of the case.

[0047] As illustrated in Figure 8, the pivot can also be made by a block 70 of elastically deformable material, for example, a foam. The latter can be attached, for example, by gluing its principal opposing surfaces 71 and 72 respectively to the plate 17 and to a support element or to the lid or to an intermediate element mobile relative to the lid.

[0048] In the case where the pivot is made of an elastomer material 30, or where the pivot is made using a block 70 of a resiliently deformable material, the pivot can be formed around a point of rotation at a distance from the free edges of the sealing element. The pivot is obtained by local shrinkage of the elastomer material or a block of elastically deformable material of transverse cross-section considerably smaller than the cross-section of the sealing element. The point of rotation is, for example, defined on the axis Z.

[0049] As it bears in a leak tight manner on its compartment, the sealing element can be difficult to open by virtue of the "suction-cup" effect. To mitigate this effect, the case can be made in a manner such that the sealing element tends to detach preferentially in a limited area on its periphery. In other words, the sealing element and/or its compartment and/or the pivot and/or the pivot support can be made so as to create an initial lift effect.

[0050] As illustrated in Figure 9, the pivot support element 11 can include one or more arms 23' made stiffer by having, for example, a larger circumferential extent or by being thicker so that torque is exerted on the sealing element on opening, tending to facilitate its detachment.

[0051] As illustrated in Figure 10, the pivot 30 can include a part 30' set off-centre so as to create an asymmetrical stress distribution on the sealing element on opening. Similarly, the pivot 70 of Figure 8 can include an off-centre part 70', as illustrated in Figure 11.

[0052] As shown in Figure 12, the sealing element can include a more flexible area capable of deforming to a greater extent on opening and facilitating detachment of the sealing element. In the example of Figure 12, the plate 17 includes a portion 17' of greater thickness such that the separation force transmitted by the pivot is distributed in a non-uniform manner to the periphery of the sealing element, thereby creating an initial lift effect.

[0053] The invention is not limited to the exemplary embodiments described above. It is notably possible to combine different features of the various embodiments here described.

[0054] Throughout the description, including the claims, the expression "including one" should be understood to be synonymous with "including at least one", unless otherwise specified.

[0055] Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that, within the scope of the appended claims, the invention can be practiced otherwise than as specifically described herein.